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ECONOMIC COMMISSION FOR ASIA AND THE FAR EAST

CAMBODIA, LAOS, THAILAND AND VIET-NAM

Committee for Co-ordination of Investigations
of the Lower Mekong Basin

Pakistan Government Mekong Technical Assistance Programme

PLAN OF OPERATION

NAM PONG IRRIGATION PROJECT

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PLAN OF OPERATION

Detailed Survey and design of Nam Pong Irrigation Project

1. INTRODUCTION

1.01 The President of Pakistan, while proposing a toast to their Majesties the King and Queen of Thailand during their royal visit to Karachi in March 1962, declared that Pakistan will be glad to join the countries participating in the development of the Lower Mekong River Basin under the auspices of the United Nations.

1.02 At the 18th Session of the Economic Commission for Asia and the Far East at Tokyo, Japan, the representative of Pakistan announced the Pakistan contribution in technical services and locally manufactured equipment valued at US$100,000 equivalent, to the Mekong Development Project.

1.03 The Committee for Co-ordination of Investigations of the Lower Mekong Basin (hereinafter referred to as the "Committee") after giving due consideration has desired that the Government of Pakistan should undertake the surveys, planning and design of the irrigation system of the Nam Pong Project in Thailand (hereinafter referred to as the "Project").

1.04 The feasibility report of the Project has been prepared by Rogers International Corporation, California, U.S.A. under the United Nations Contract 84/60.

1.05 As desired by the Committee, the Government of Pakistan has indicated its willingness to undertake the detailed surveys, planning and design of the irrigation system of the project, through their Agents (hereinafter referred to as the "Pak-Engineers")

1.06 The Government of Thailand has undertaken in principle to meet the local cost and provide facilities for carrying out the detailed surveys necessary for the proposed planning and design of the irrigation system of the project, through their National Energy Authority (hereinafter referred to as "NEA").

/ 1.07

1.07 The present document sets forth the Plan of Operation for the surveys, investigations, planning and design of the irrigation aspects of the Nam Pong Project to be undertaken by the Government of Pakistan in cooperation with the Government of Thailand and the Committee.

2. DESCRIPTION OF THE PROJECT

2.01 A feasibility report of Nam Pong Project, has been prepared by Rogers International Corporation in March 1962. The project as conceived is multipurpose involving the major aspects of hydro power development, irrigation and flood control. The storage dam across the Nam Pong river is proposed at Pong Neeb where the river cuts through a range of hills. The reservoir so created will have a capacity of 2,010 million cubic meters which can to a considerable extent absorb, the annual floods in the river. It is proposed to install a power-house just below this dam with a capacity to generate 25,000 kW of electricity. Water from the turbines of this station will be let down into the river and picked up at a lower point. Here a diversion dam will be constructed with a provision for developing another 7,500 kW of electricity from a power house annexed to the dam. The canal system from this diversion dam will provide water to irrigate an area of 22,000 hectares.

2.02 The scope of this Plan of Operation covers only the irrigation aspects of the project. It covers the detailed surveys and designs of diversion dam and the canal system required for irrigating 22,000 hectares of land. It also covers a preliminary appraisal of future possibilities for the extension of irrigation under the project.

3. WORK PLAN

A. Participation of the Government of Pakistan

The Government of Pakistan through their Agents, "the Pak-Engineers", will undertake to get the following works completed.

/ (i) Surveys

(i) Surveys

3.01 Reconnaissance of the river and selection of the best location for the diversion dam.

3.02 Geological reconnaissance of the area and recommendations to the N.E.A. for carrying out foundation exploratory borings at the selected site. Evaluation of boring results.

3.03 Carrying out soil tests, if necessary, and evaluation of these tests for engineering requirements.

3.04 Detailed surveys necessary for the diversion dam and its appurtenant works, and demarcation on the field with concrete pillars the selected alignment of the diversion dam.

3.05 Detailed surveys and fixing the alignment of main canal upto a point where it can command a net irrigable area of about 22,000 hectares. The surveys will cover levels at every 25 meters and cross section, at every 200 meters apart. This alignment will be demarcated in the field with the fixation of concrete pillars at all apex points.

3.06 Detailed surveys at all structure sites on main canal with contours every 1/2 meter apart.

3.07 Contour surveys of commanded area to the extent of about 22,000 hectares of net irrigable area. These surveys will be plotted on a scale of 1:10,000 and will have contours at 1 meter invervals. One permanent benchmark will be fixed approximately every 400 hectares of irrigable area.

3.08 Preliminary survey for the extension of main canal upto a point where it can command a total irrigable area of about 44,000 hectares.

3.09 Detailed agricultural and socio-economic survey in the area of about 22,000 hectares to the extent required for the project. This will include collection and analysis of soil samples.

/ (ii) Designs

(ii) Designs

3.10 Detailed designs of diversion dam and appurtenant works to the extent necessary for the preparation of detailed estimates and call for tenders.

3.11 Detailed design of main canal and its structures to the extent necessary for detailed estimates and call for tenders.

3.12 Marking alignment of laterals, minors and drainage channels on 1 meter contour maps prepared for the commanded area and preparing typical designs of various channels including those of structures in the distribution system.

3.13 Estimate of the possible generation of power at the diversion dam taking into consideration the water to be released at Pong Neeb dam and the abstraction for irrigation requirements.

3.14 Evaluation of the results of detailed soil analysis of the 22,000 hectares of irrigable area, giving broad outline of the type and feasibility of soils, together with recommendations regarding the type and pattern of crops and type of fertilizers best suited to the soils and climatic conditions.

(iii) Specifications and tender documents

3.15 Specifications for diversion dam and its appurtenant works.

3.16 Specifications for main canal, laterals, minor and drainage channels.

3.17 Specifications for structures on main canal, laterals minors and drainage channels.

3.18 Typical tender documents.

3.19 Report on available materials for construction.

3.20 Preparation of construction schedule.

/ (iv)

(iv) Estimates

3.21 Preparing estimates of cost of construction of the project broken down into annual funds requirement, in local currency and foreign currency requirements.

3.22 Schedule of benefits to be arrived at after the completion of the project.

(v) Comprehensive Project Report

3.23 Preparation of a comprehensive project report summarizing the results of studies outlined above, together with necessary plans, drawings, specifications and project estimates as well as the investigations of power possibility, water-use, manurial requirements and other socio-economic factors necessary for a successful operation of the project. This report will be in English, incorporating metric system of weights and measures. Thirty copies of this report will be supplied to the Committee.

B. Participation of the Government of Thailand

The Government of Thailand through their Agents "the NEA" will undertake to provide the following facilities:

3.24 Transport within Thailand for Pak-Engineers personnel for the purpose of the project, including provision of two jeeps and railway-fare, maintenance and operation of transport vehicles; transport, handling and storage of project equipment.

3.25 Furnished accommodation for Pak-Engineers personnel at the project site and within the project area. Three tents with furniture will be provided for use where no other accommodation is available.

3.26 The following survey instruments will be provided:

Plane tables	3 sets
Levelling instruments	3
Theodolites	2
Levelling Staves	14
Measuring Chains	6
Metallic tapes	9

/ Drawing

Drawing instruments and materials, as may be required for plotting the field work, will also be supplied.

3.27 Carrying out borings where required by the Pak-Engineers indicating geological strata. (It is estimated that about 15-20 borings may be required at the diversion dam site and at the site of canal structures). The cores derived from these bores will be stored at a suitable place for inspection of senior officers of the Pak-Engineers.

3.28 Despatching by air soil samples collected by the Pak-Engineers to Pakistan for soil tests for engineering analysis as well as for agricultural evaluation. (It is expected that about 150 such soil samples may be required to be sent to Karachi).

3.29 Supplying all available maps, aerial photographs, hydrological and statistical data and such other publications and reports that may pertain to the project or may help in designing it.

This will include the following (The list, however, is not exhaustive).

(a) Four sets of 1 in 50,000 printed contour maps (AMF) with 10 m interval contours.

(b) One set of 1 in 10,000 aerial photographs of the project area including the commanded area.

(c) Four sets of 1 in 20,000 contour maps with 5 m contour interval prepared by the Government of Canada when available.

(d) Two copies of feasibility report of Nam Pong project by Rogers International Corporation along with their detailed analysis.

(e) Analysis showing the maximum extent of flood discharge that will be passed at Pong Neeb through spillway and river outlets, if available.

(f) The supplies that will be let down into the river from the Pong Neeb reservoir for irrigation and power generation at the diversion dam site, if available. These shall include daily, monthly and yearly fluctuations covering a period of about 20 years.

/ (g)

(g) Report on Agro-pedological study of the Upper Nam Chee Basin, by "Sogreah" to be given on loan.

3.30 Local labour required for surveys. It is expected that about 10,000 man-days will be required. It is desirable that a number of technical personnel of NEA should be attached with Pak-Engineers to act as liaison officers and interpreters.

3.31 Office accommodation, secretarial help, and conveyance at Bangkok for one officer of the Pak-Engineers.

3.32 Providing and fixing small precast concrete pillars duly numbered at the diversion dam site and also along the main canal and inside the commanded area. The location of these permanent marks will be shown by the Pak-Engineers.

3.33 Supplying the Pak-Engineers with a list of existing reliable benchmarks within and in the neighbourhood of the project area, giving their value in mean sea level, their exact location and the order of levelling (accuracy) to which they belong.

3.34 An engineer will be deputed to work as Liaison Engineer with whom the personnel of the Pak-Engineers will deal in matters connected with the project.

3.35 The Pak-Engineers shall be supplied with rainfall data for as many years as available and for all stations within the project area and its neighbourhood.

3.36 The Pak-Engineers shall be supplied with available statistics on any agricultural experiments already done in the country and other matters related to the agricultural aspects of the project.

4. PRIVILEGES AND IMMUNITIES

4.1 The Pak-Engineers and their personnel (except nationals of Thailand) shall be granted the following privileges and immunities:

/ (a)

(a) The privilege of bringing into the country reasonable amounts of foreign currency for the purposes of the project or for personal use of such personnel and of withdrawing any such amounts brought into the country, or, in accordance with the relevant foreign exchange regulations, such amounts as may be earned therein by such personnel in the execution of the Project;

(b) The same repatriation facilities in the event of international crises as diplomatic envoys; and

(c) Immunity from national service regulations, and from immigration restrictions.

4.2 The Government of Thailand shall either exempt from or bear the cost of, any taxes, fees or levies which may be imposed by it on the Pak-Engineers and the foreign imported personnel of the Pak-Engineers in respect of:

(a) The salaries or wages earned by them in the execution of the Project;

(b) Their personal effects, if imported under six months after the owners' first arrival to take up their posts in Thailand;

(c) Any equipment, materials and supplies brought into the country in connection with this project or which, after having been brought into the country, may be subsequently withdrawn therefrom.

4.3 The privileges and immunities referred to above may be waived by the Government of Pakistan where in its opinion the immunity would impede the course of justice and where such waives does not prejudice the successful completion of the Project.

/ 5. ACCESS

5. ACCESS AND SECURITY

5.1 The Government of Thailand will within its territory take whatever action is necessary to provide the necessary lands or rights of way and provide the Pak-Engineers with access to and use of the site of the work and will assume liability for damage which may occur to property which is used, occupied or affected by the work outlined above, unless such damage is caused by the negligence or fault of the Pak-Engineers.

5.2 The Government of Thailand will furnish necessary personnel to provide security of the Pak-Engineers staff engaged in the execution of the Project.

5.3 To the extent that the Pak-Engineers are required to perform services under this contract in Thailand, unless otherwise provided in this Plan of Operation, the Pak-Engineers shall comply with all applicable laws, rules and regulations, including those of provinces, municipalities and other governmental units thereof.

6. TRAINING OF THAI ENGINEERS IN PAKISTAN

6.01 The Government of Pakistan agree to train four Thai engineers in Pakistan at the office of the Pak-Engineers during the period when the design of the project is being processed. The Thai Engineers will receive per diem allowance from the Government of Pakistan during their period of training at a rate of Rs. 30/-. It is expected that this period of training may extend from 4 to 6 months. The cost of air passage from Bangkok to Karachi and back will be paid by the Government of Thailand.

7. SCHEDULE OF OPERATIONS

7.01 It is expected that approximately the following personnel will be imported by the Pak-Engineers for work on the surveys and investigations of the Project:

Project Manager	10-man month
Engineers and Surveyors	80-man month
Agricultural Officers	30-man month

/ Besides

Besides, there will be frequent visits to Thailand by senior engineers, geologist and senior agricultural officer of the Pak-Engineers. The maximum number of personnel at any one time in Thailand may be about 15 to 16.

7.02 It is expected that the work on the Project will be completed within a period of 12 to 15 months depending upon the time of the year when this Plan of Operation is signed and becomes effective. The surveys will require one complete working season from October to May. The design of the Project will be carried out in the office of the Pak-Engineers in Pakistan and will take 5-6 months after the field work has been completed.

8. FORCE MAJEURE

8.01 If the Pak-Engineers are temporarily rendered unable to perform their duties and responsibilities, wholly or in part, by force majeure, or laws or regulations, it is hereby agreed that this plan of operation can be postponed with the mutual consent of the Government of Pakistan, Government of Thailand and the Committee. The term "force majeure" as employed herein shall mean acts of God, acts of the public enemy, wars, blockades, insurrections, riots, epidemics, earthquakes, civil disturbances and any other cause similar to the kind herein enumerated or an equivalent force not within the control of either party, and which by the exercise of due deligence neither party is able to overcome.

/ Present agreement

The present agreement will come into force from the date of signature.

Date: 6 December 1962

(Signed) Phlek Chhat
For the Government of Cambodia

Date: 22 November 1962

(Signed) Phouangkeoh Phanaret
for the Government of Laos

Date: 19 November 1962

(Signed) M.S.A. Baig
For the Government of Pakistan

Date: 19 November 1962

(Signed) Nitipat Jalicha.
For the Government of Thailand

Date: 8 December 1962

(Signed) Pham-Minh-Duong
For the Government of Viet-Nam

Date: 19 November 1962

(Signed) C. Hart Schaaf
Executive Agent of the Committee
for Coordination of Investigations
of the Lower Mekong Basin